

directs attention to the importance of a proper incubation temperature. He found, using the liquid culture, that the yield of lactic acid at 105° F. was more than one and a half times that at 85° F., and more than one and one-third times that at blood heat, $98\frac{1}{2}$ F. Samples of five preparations were also examined for the *British Medical Journal*¹ with the following results:—

Percentage of Lactic Acid Produced.

Sample	After 10 hour's incubation
(1) Fluid culture (Oppenheimer) 0·96
(2) Fermentactyl tablets 0·00
(3) Lactobacilline 0·02
(4) Sauerin 0·07
(5) Trilactine 0·27

From this table it will be seen that the liquid culture is far superior to the tablets. The writer also examined² liquid sauerin, and sauerin, trilactine, and fermentactyl tablets, and of these the liquid sauerin alone could be considered satisfactory.

In response to a request by the editor, several firms have been good enough to furnish preparations which

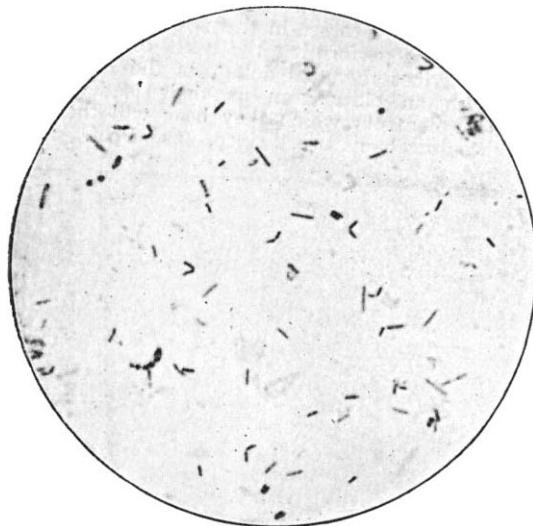


FIG. 2.—Film of soured milk prepared with tablet starter. Numbers of small Gram-negative bacilli present (Gram and eosin, $\times 1200$).

have been examined by the writer with the following results:—

I. Content of *B. bulgaricus*:—

(1) Tablets.

(a) *B. bulgaricus* present in $1/100$ and $1/1000$ of a tablet, not in less. Streptococci also present.

(b), (c), (d) Very few *B. bulgaricus* present, even in $1/100$ of a tablet; milk not curdled.

(2) Fluid Culture.

(a), (b), and (c) *B. bulgaricus* present even in $1/100,000,000$ c.c. No streptococci.

(3) Tablets.

(a), (b), and (c) Very few *B. bulgaricus* present even in $1/100$ of a tablet; milk not curdled.

(4) Lactic Cheese.

B. bulgaricus present in $1/100,000$ gram, not in less. Streptococci present.

(5) Sour Milk Cream Cheese.

B. bulgaricus present even in $1/100,000,000$ gram. Streptococci present.

From this it will be apparent that the fluid preparation (No. 2) has a content of *B. bulgaricus* enormously

greater than the tablet preparations (Nos. 1 and 3). The lactic cheeses, if fairly fresh, contain a high content of *B. bulgaricus*, and are a pleasant and wholesome addition to the diet.

II. Characters of soured milk made with the preparations:—

(1) Tablet.—Milk markedly curdled. Acid, but somewhat cheesy odour. *B. bulgaricus* present in moderate number, also streptococci. Gram-negative bacilli present.

(2) Fluid Culture.—Milk well curdled. Acid, pleasant odour. Abundance of *B. bulgaricus*; no other micro-organism.

(3) Tablet.—Milk curdled, but *B. bulgaricus* scanty. Gram-negative bacilli present.

The result of these tests is to show that the tablet preparations do not produce a satisfactory soured milk, and the product is contaminated with bacilli other than the *B. bulgaricus* (see Fig. 2). The fluid culture, on the other hand, yielded an excellent soured milk, the flavour of which, however, would probably be improved if lactic streptococci were present in addition.

Special lactic acid-producing streptococci (*e.g.* *S. lebensis*) are always present in the natural sour milks, they aid the rapid growth of the *B. bulgaricus* by producing an acid environment, they tend to lessen the separation of the curd, and, in the writer's opinion, render the soured milk more palatable.

The small content of *B. bulgaricus* present in dry tablet preparations renders these comparatively inefficient for internal administration, and not to be compared with the ingestion of even a few cubic centimetres of properly soured milk.

I am indebted for the photomicrographs to Mr. J. E. Barnard.

R. T. HEWLETT.

THE BRITISH SCHOOL AT ATHENS.¹

THE fifteenth volume of the "Annual of the British School at Athens" is somewhat less in bulk than its immediate predecessor. Probably its present length is about the extreme of what is convenient for a book of this format. The most important articles, as before, are those which describe the continuation of the work of the school at Sparta, which has been so successful, and has conferred such great distinction upon British archaeology in Greece. Mr. Dawkins, the director, describes the work generally, and the conclusion of the excavation of the sanctuary of Artemis Orthia, and Mr. Droop the pottery, with regard to which he has made important discoveries which have given us quite a new idea of the history of ceramic art in the Peloponnese. The long list of inscriptions recovered in the sanctuary of Artemis Orthia is finally disposed of by Mr. A. M. Woodward, who appends to his admirable and painstaking work a series of corrections of re-discovered inscriptions which had previously been copied by Fourmont.

The main part of this section of the "Annual" is devoted to the description of the Menelaion, the *heroon* of Menelaos and Helen, of whom the latter, at any rate, seems to have been originally a minor deity, a nature-goddess, akin to Artemis Orthia herself. The shrine is placed on a hill a little to the south of Sparta, and was solidly built on a strong revetment-wall of great stone blocks, to which the top of the hill serves as a core. This imposing work is probably of the fifth century B.C., but the explorers found many traces of far older occupation, going back to the Mycenaean period.

A large number of smaller antiquities were dis-

¹ "The Annual of the British School at Athens," No. xv. Session 1908-9. Pp. viii+412+20 plates. (London: Macmillan and Co., Ltd., n.d.) Price 25s. net.

covered, mainly small votive offerings, consisting chiefly of figurines of terra-cotta and lead. These leaden figures are extremely interesting, and are well published in a series of plates. Those of warriors are



FIG. 1.—A Laconian Vase of the Seventh Century. From "The Annual of the British School at Athens."

of remarkable interest, as showing Spartan military dress from the seventh century onward. Small ornaments of lead, such as little spiked wreaths, were found in enormous numbers; Egyptian scarabs were found; of these one, pl. viii., Fig. 4, is published upside down. These are of the seventh century, as also is a ring (Fig. 12, p. 142).

The work at the Menelaion is described by Messrs. Wace, Thompson, and Droop. Sandwiched between this and the preceding descriptions is a curious note on a Scottish parallel to the Spartan custom of electing the dead Lycurgus as eponymous *Patronomus*; in 1547 St. Giles himself was elected patron provost of Elgin for "ane zeyr nyxt to cum." This note, which is by Mr. P. Giles, seems a little incongruous in the prominent position which it occupies, and would have been better as a footnote somewhere else.

Messrs. Wace and Hasluck continue their interesting notes on the topography of Lakonia, and Mr. Traquair describes the notable churches of western Mani. The revival of church building by the always independent Maniates at the end of the eighteenth century is interesting; it seems probable that this was largely due to the Greek cruise of the Russian squadron of Orlov, which revived the hopes of Orthodox Christendom for freedom from the domination of Islam. Mr. Hasluck continues his researches into the byways of Greek history during the Frankish period with his articles on "Monuments of the Gattelusi" (the Genoese lords of Aenos on the Maritza) in the Aegean, and on "Frankish Remains at Adalia," and also deals with "Albanian Settlements in the Aegean Islands." We return to the classical period with Mr. Woodward's article on a new fragment of an Athenian "Quota-List of the year 417-6 B.C.," giving the amounts paid by the subject-allies to the treasury of the Confederation of Delos in that year, and with Dr. Duncan Mackenzie's interesting reconstruction of figures in the East Pediment of the Temple of Aegina, in opposition to the views of the late Prof. Furtwangler. Dr. Mackenzie has, we are sorry to say, held over the next instalment of his long article on "Cretan Palaces," which has been a feature of recent volumes of the "Annual." Messrs. Wace and Thompson also contribute a short article on their discovery of "A Cave of the Nymphs on

Mount Ossa," previously unknown. A large number of fragmentary votive *stelae* were found.

The third portion of this year's "Annual," and not the least important, also deals with Greek religion. This is the publication by Profs. Bosanquet and Gilbert Murray of the Hymn to the Kouretes, the warrior guardians of the infant Zeus, who, like the Salii of Rome, with whom they were compared long ago, leapt in their dance with clashing of sword and spear. In the hymn, which was discovered during the excavations of the school at Palaikastro, in Crete, the worshippers of Zeus pray the god to leap as did the Kouretes around him when a babe, as a ritual act to bring prosperity and good fortune to Crete: "To us also leap for full jars, and leap for fleecy flocks, and leap for fields of fruit, and for hives to bring increase. Leap for our cities, and leap for our sea borne ships, and leap for young citizens and for goodly law." So Prof. Murray admirably translates the Greek of the hymn. The march and dance of the Kouretes and the Salii remind one greatly of the leaping March of the Minoan "Harvesters," as they are called, on the steatite vase found by the Italian excavators at Agia Triada, in Crete, some years ago, of which a cast may now be seen in the British Museum. Are we to see in them Kouretes, or rather the young men performing the parts of Kouretes, as Strabo describes them as doing, in the mysteries of Zeus, with an older man as their leader? The curious implements which they bear will then be of an agricultural nature, since, as Prof. Murray

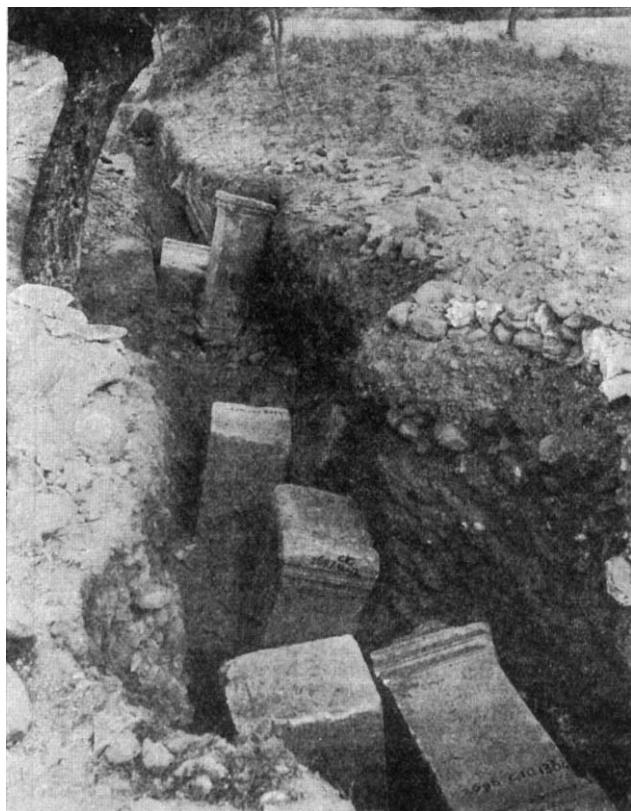


FIG. 2.—The re-discovered inscriptions in the Shrine of Orthia. From "The Annual of the British School at Athens."

observes, the Kouretes "were certainly connected with spring and fertility" (p. 360), but developed later into weapons, which Prof. Savignoni and the Italian archaeologists first took them to be. I am, at the

moment of writing, uncertain whether or not this comparison has been made before.

The restoration of the text of the hymn and the translation by Prof. Murray is very interesting. I speak under correction, but is *παγκρατες γανος* really to be rendered by "Lord of all that is wet and gleaming"? Why should Zeus Kouros be lord of all that is "wet and gleaming"? Why not "bright and Gleaming"? Though no doubt *γανος* gives, strictly, the idea of "wet and gleaming," yet surely the reference is to the gleaming ripple of the cornfields, not to the sea?

Of the admirable character of the translation a specimen has been given above.

The myth of the Kouretes in its anthropological aspect is dealt with by Miss Jane Harrison, who treats it with her usual learning and wealth of illustration. Her conclusions are important, as bringing the dance of the Kouretes into connection with the initiatory rites at adolescence which are common among savage tribes; she aptly compares them with the initiation ceremonies in use among the Wirad-thuri tribes of New South Wales. The scent on the Agia Triada vase derives a new significance from this comparison.

The director contributes a scheme for the transliteration of modern Greek, which is to be used in future by contributors to the "Annual," with the exception that *η* is to be transliterated by *e* and not by *i*. This seems rather too great a concession to the weaker brethren; it gives an entirely wrong impression of the pronunciation to those who are accustomed to the values of *e* and *i* in foreign words.

The volume is one of the most interesting that the school has produced, although for the first time we miss in it any description of Minoan or Mycenæan discoveries. But the resumed excavations at Phylakopi, in Melos, which are now to be taken in hand, will no doubt enable the School to contribute again very shortly important material for the study of prehistoric Greece.

H. R. HALL.

KOREAN METEOROLOGY—OLD AND NEW.¹

FOR the last six years a meteorological observatory, equipped with modern instruments, has existed at Chemulpo, and has been working energetically to establish a network of stations, from which the climatic elements of the country might be derived. Many difficulties have been encountered, but that these have been successfully overcome is shown by the issue of the first volume of scientific memoirs from the observatory, in which the director, Dr. Y. Wada, describes the progress that has been made and sketches the programme it is proposed to follow. He is to be congratulated upon the success of his vigorous direction, for a map shows that forty-five stations have been furnished with instruments, from which reports are received regularly. Most of these stations are scattered round the coast, at lighthouses, but there is also a chain of observatories running through the interior, and these no doubt will be increased as the country progresses.

A paper by Dr. T. Hirata shows that discussion proceeds simultaneously with the collection of observations. He investigates the amount of evaporation in Korea and South Manchuria, and its relation to precipitation. Although the data at present are slender, and the conclusions somewhat precarious, the inquiry is one of great economical importance, because the quantity of rain is barely sufficient to ensure the safety of the rice harvest on which the welfare of the

country largely depends, and all information connected with moisture is of deep significance.

But as such inquiries have only a local interest and would fail to attract attention, Dr. Wada has done

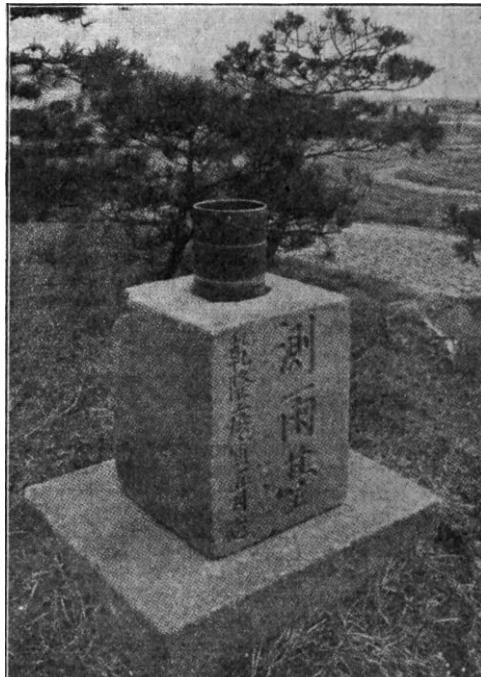


FIG. 1.—Old Raingauge in Taiko.

well to quicken curiosity by reference to the science that flourished in the Korea of the past. He shows that the raingauge, supposed to have been invented by Castelli, about 1639, was in use in the East long before its value

was appreciated in Europe. Dr. Wada, quoting from the second volume of the historical annals, explains that in the sixth year of the reign of King Sejo (corresponding to 1442 in the Gregorian Calendar), the King had a bronze instrument constructed to measure the rainfall. It was a vase of a depth of 30 cm. and a diameter of 14 cm. Every time rain fell, observatory officials measured the height and informed the King. But the important point in this account is, that this was not a toy set up from curiosity, but that similar instruments were distributed throughout the provinces, and the results of all observations were reported to the court. Naturally

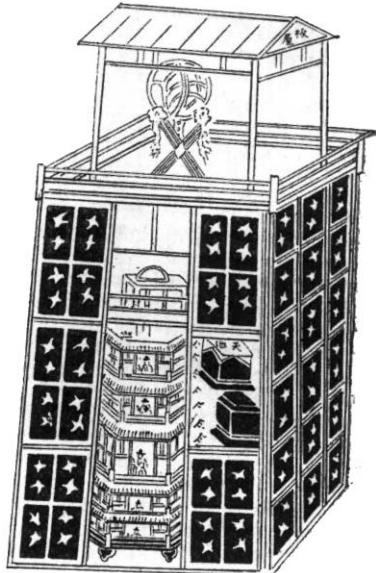


FIG. 2.—A Chinese Clepsydra of about 820 years ago.

¹ "Scientific Memoirs of the Korean Meteorological Observatory." Vol. i. Chemulpo, Korea, 1910.)